In the Drawings

Please accept a sheet including an amended version of Figure 10 introducing the characters A and B as identifying inflection points on the curve of the graph. A second copy showing this change in red is also attached.

Discussion

Scope of Figure 6

The examiner had previously asked for an election between Figures 4, 5, 6, 7 and 8 of the figures in the original disclosure specification. The applicant elected Figure 6, with traverse.

In responding to the applicant's election, the examiner has observed that there is no support in the disclosure with respect to the Figure 6 embodiment for the feature that the mid-section region is more than 5% thicker than the adjacent, lateral regions. Accordingly, the examiner has withdrawn claims 21, 41 and 42/41 pending the possible establishment in the application of an allowable generic claim. The applicant will first demonstrate that there is support with respect to Figure 6 for this and other thickness stipulations.

Support for thickness characteristics in Figure 6

Figure 6 is addressed in the disclosure not only by the depiction in the drawing, but also by various features of the invention that are indicated in the disclosure in a way that can be attributed to Figure 6. One important parameter that can be attributed to Figure 6 is the thickening of the barrel wall in order to produce a mid-section in the barrel portion wherein the barrel wall has an increased barrel wall radial stiffness over the radial stiffness of the barrel wall in the two lateral portions.

References in the disclosure in respect to the species of Figure 6 that indicate that the barrel wall thickness can be used as the controlling structure to achieve the radial stiffness result required of the invention occur in the following paragraphs:

> [0064] A third embodiment of the present invention Fig. 6 is a single wall tubular polymer composite baseball bat which in accordance with the present invention has a localized area of fiber type and/or angle change 20 resulting in increased radial stiffness generally in the sweet spot area 19 located in proximity to the middle area of the barrel length 1. This embodiment applies equally well to double-wall and multi-wall (more than two walls) tubular all polymer composite baseball bats ..... The fiber types, and/or fiber angles, and/or fiber sizes, ***and/or composite thickness*** can be

designed such as to graduate the radial stiffness of the barrel wall within the barrel portion 1 along its entire length. That is, the radial stiffness could be highest in the peak performance area (generally the sweet spot area 19) and gradually changing in uniform increments proceeding towards the barrel ends.

In his last office action, the examiner himself treated Claim 40 as still being under examination and therefore, presumably, exemplified by the species of Figure 6. Claim 40 as previously pending provided the following specific limitation:

"....wherein the barrel wall of the barrel portion has a thickness and the barrel wall has a thickness in the mid-section that is greater than the thickness of the barrel wall in the lateral regions."

Figure 6 exemplifies the effect of thickness on the invention, and is further supported in the disclosure by the additional passages discussed next.

Previously, in discussing the stiffener 18 as depicted in Figures 4, 5, 7 and 8, the disclosure in paragraph [0062] refers to the increase in barrel wall thickness provided by the presence of such stiffener 18, a stiffener which is typically on the order of .005 inches to .040 inches in thickness. Then this paragraph, as pending prior to this Response, further states:

[0062]. .....Analogous to Figures 4, 5, 7 and 8 an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to ***vary the barrel thickness*** 6 along any portion of the barrel length 1 in order to vary bat performance. The ***barrel portion's effective wall thickness in the mid-section can be greater by 5% over the thickness of the barrel in the lateral, adjacent portions.*** (Emphasis added) Conversely, the barrel wall's thickness beyond its central portion, in the lateral regions proceeding towards the end portions of the barrel, may be at least 5% thinner than the thickness of the barrel wall in the mid-section.

It is apparent from the fact that this characteristic is being contrasted with Figures 4, 5, 7 and 8, that this characteristic also applies to Figure 6. Accordingly, it is submitted that there is support in the disclosure for the features of Claims 21 and 41, as well as Claims 19, 20 and 40 in respect of the species of the invention as elected, with traverse, by the applicant.

Paragraph [0062] makes a clear statement that an alternative solution to Figures 4, 5, 7 and 8, vis Figure 6, is to thicken the mid-section portion of the barrel wall in a manner akin to the thickening provided in Figures 4, 5, 7 and 8 by the stiffener 18. Accordingly, to make this absolutely clear, the applicant is now proposing to make the following amendment to paragraph [0062]:

[0062] ...Analogous to Figures 4, 5, 7 and 8 an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to vary the barrel thickness 6 **to the same extent and manner** along ~~any portion of~~ the barrel length 1 **of any bat according to the invention, including the bat of Figure 6,** in order to vary bat performance.

It is submitted that this amendment does not constitute new matter because it only makes apparent what has been indicated by the analogy that is explicitly referenced.

Other Amendments to the disclosure

Paragraphs [0051], [0055] and [0061] are being amended clerically, as shown in Schedule B, attached hereto.

A further amendment to the disclosure as set out in Schedule B attached hereto would provide an amended paragraph [0060] as follows:

[0060] In Figure 10, in an example of the present invention, the combined barrel wall, with the polymer composite stiffener 18 present, is approximately twice as stiff in the center 2 inches of the sweet spot area 19 as in the 1 inch area immediately adjacent to the center or mid-section area on each side of the center area. The polymer composite stiffener 18 fiber type, fiber angles and thicknesses are designed such as to reduce the bbs from 100 to 96 in the center 2 inch area of the barrel length 1 and from 98 to 96 bbs in the 1 inch areas immediately adjacent to the center area. As a result of the present invention, the resultant typical example bat meets the lowered regulatory standard of 96 bbs with a sweet spot area 19 which has been increased by 100% (from 2 inch wide to 4 inch wide). **At the same time the regions around points A and B have been introduced into the batting performance curve of Figure 10 that were not present in the curve of Figure 9, with the more flattened portion there-between that is characteristic of an extended sweet spot area 19.**

This amendment introduces the points A and B and verbalizes the flattened character of the batting performance curve there between. Such points and curvature were clearly apparent on Figure 10 and have merely been labeled. No new matter is being added.

Percentage value for increased thickness

The value of 5% referenced in paragraph [0062] from the disclosure was originally present in Claim 13 and was added by amendment to this paragraph in the last Response. As well as by way of the presence of a claim in the original filing that actually

recited a 5% increase in thickness, there was and is support in the original specification for this and other percentage increases in thickness.

The original disclosure referenced bat wall thickness in bats according to the invention as having various ranges, one of which included 0.100 inches. This disclosure also referenced a range of thicknesses for the stiffener 18 of from 0.005 to 0.040 inches, a range which the applicant has demonstrated above is also applicable to the increased thickness of the mid-section of the embodiment of Figure 6. The 5% figure for the increase to wall thickness in the mid-section originally referenced in claim 13 can be derived by combining a stiffener of 0.005 inches in thickness with a bat wall that is 0.100 inches thick.

However, since stiffness is proportional to thickness, it is most logical to combine the smallest proposed increase in thickness with the bat having the thinnest wall. On this basis it can also be said from the data in the original disclosure that an increased thickness of (0.060 + 0.005 divided by 0.060) or 8 1/3% will also provide the benefits of the invention.

As the object of the invention is to increase the radial stiffness of a bat in the mid-section of the barrel, the above percentage value is the preferred minimum percentage value for increased wall thickness. The applicant proposes to amend the disclosure to provide 8 1/3% as an alternate minimum value to achieve the benefits of the invention to be claimed by the patentee. The claims are also being amended such that this alternate thickness value narrows the scope of coverage from 5%.

It is submitted on the basis of the above demonstration that the applicant is entitled to adopt an alternate limitation of 8 1/3 % as not constituting new matter. Further it is also submitted that, taking into consideration the wording of the disclosure as referenced above, such a feature is inherent in or attributable to the species of Figure 6.

Accordingly, it is on this basis that the applicant proposes to make the following amendments to paragraph [0062] to provide that it read as follows:

[0062] The thin polymer composite stiffener 18 of the present invention has a stiffener wall which is typically in the order of .005 inches to .040 inches in thickness, with a length of 2 inches to 6 inches which is typically less than 50% of the barrel length, such as 16 2/3 % of the barrel length, as is apparent from Figure 10. A 4 inch stiffener, as referenced in paragraph [0059], in a 12 inch barrel as referenced in Figure 10, would represent 33.3% of the barrel length; a 4 inch ~~stiffner~~ **stiffener** in a 16 inch barrel would represent 25%, and a 2 inch ~~stiffner~~ **stiffener** in a 16 inch barrel would represent 12.5% of the barrel length. The stiffener 18 is preferably bonded, fully or partially, to the main member 16, or to the secondary member insert 13 of

Fig. 7 or to the secondary member sleeve 14 of Fig. 8, or combinations thereof on either the internal or external barrel walls, as shown in Figures 4, 5, 7 and 8. Analogous to Figures 4, 5, 7 and 8 an alternative solution (since stiffness is proportional to thickness) to the stiffener 18 is to vary the barrel thickness 6 **to the same extent and manner** along ~~**any portion of**~~ the barrel length 1 **of any bat according to the invention, including the bat of Figure 6,** in order to vary bat performance. The barrel portion's effective wall thickness in the mid-section can be greater by 5% **or by 8 1/3 % or more** over the thickness of the barrel in the lateral, adjacent portions. Conversely, the barrel wall's thickness beyond its central portion, in the lateral regions proceeding towards the end portions of the barrel, may be at least 5% **or 8 1/3** % thinner than the thickness of the barrel wall in the mid-section.

Range of absolute increased thickness for mid-section

As quoted above at the beginning of paragraph [0062], a range is provided for the thickness of the stiffener 18 of from .005 inches to .040 inches in thickness. It is obvious that in having identified this range, the inventors have also identified sub-ranges within that range in the sense understood in the case In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). For the convenience of the examiner, a copy of that case is being provided separately provided with this Response. In particular, that case sets forth the principle that when a specification sets forth the range, and it is obvious that the inventors had possession of or understood the invention as being present throughout the range, then the inventors have equally invented sub-ranges within the original range. Thus in the Wertheim case, where an original broad range of 25 to 60% solids for a formulation to make freeze-dried coffee was disclosed initially, an amendment and claims permitting the Wertheim applicant to stipulate for a range of 35 to 60% was allowed.

On this same basis, the applicant proposes to add the following concluding sentence to paragraph [0062]:

" Just as the stiffener wall may be typically in the order of .005 inches to .040 inches in thickness, or .010 inches to .040 inches in thickness, or .015 inches to .040 inches in thickness, or 0.015 to 0.030 inches, so too the analogous increase in barrel wall thickness along the mid-section may fall within the same ranges.

This concludes all of the amendments being made to paragraph [0062], including a grammatical correction to the word "stiffener". The applicant submits that no new matter is being added to the application by this amendment.

Fiber type contribution to radial stiffness

An amendment is also being made to paragraph [0064] to make explicit that increased radial stiffness generally in the sweet spot area 19 can be provided through use of: ".... a localized area of fiber type **of greater stiffness** and/or angle change 20

resulting in increased radial stiffness generally in the sweet spot area 19 located in proximity to the middle area of the barrel length 1." It is obvious that the reference to the fiber type refers to either the dernier or composition of a fiber as governing its stiffness. This is being made explicit. Again, no new matter is being added to the application by this amendment.

Present Inventors' Contribution

Before addressing how, with amendment, Claim 14 can no longer be said to be anticipated by Fritzke '022, the applicant wishes to reiterate the essence of the inventive advance and unanticipated results achieved by the present applicants.

This invention takes a new direction in the design of bats. A key advance is to enlargen the sweet spot in the mid-section of the barrel portion of a bat. According to one characterization of the invention this result occurs in conjunction with flattening the performance of a bat over a region of the barrel portion from what otherwise would exist, with the previously unanticipated result of a concurrent improvement in the width of the "sweet spot". By increasing the radial stiffness of the wall of the barrel portion in the region containing the sweet spot to make such stiffness greater than in the two lateral regions, the dimensions of the "sweet spot" are enlarged.

As indicated in the previous Response by reference to prior art patent US 6,042,493 (to Chauvin filed on May 14, 1998 and issued March 20 8, 2000) the pre-existing consensus in the prior art is reflected in the following paragraph (column 1 line 32):

> "The object of using reinforcing inserts is to increase the compliance (flexibility) of the bat while simultaneously controlling the stress in the outer shell. That is, the reinforced bat is more compliant (or flexible) and can deflect more before experiencing permanent set or yield (that is, before it is dented). A more compliant bat is said to enhance player comfort and performance by reducing the amount of sting that can be experienced during ball impact. A more compliant bat is also said to have a wider "sweet spot." (Emphasis added)

By way of contrast, the present invention aspires to stiffen radially a mid-section region of the barrel portion, thereby enlarging the dimensions of the sweet spot. Previously, bats were made more compliant, e.g. decreasing radial stiffness along the entire length of the barrel wall, in order to increase bat performance and, according to previous understanding, enlarge the sweet spot. In the present invention the radial stiffness of the barrel wall in its mid-section is increased as compared to the two lateral regions in order to enlargen the sweet spot. This was a feature and consequence which was not contemplated or recognized in any of the prior art cited by the examiner.

A further important observation is that the present invention does not simply contemplate radially stiffening the barrel wall in the region of the sweet spot. To achieve the results of the invention, the radial stiffness of the barrel wall in the mid-section is made greater than the radial stiffness of the barrel wall on the adjacent to lateral regions extending on either side of the mid-section towards, respectively, the distal and proximal ends of the bat. These two lateral regions of lesser radial stiffness continue to provide elastic deflection in the barrel wall which serves to maintain batting performance at a desired level in the mid-section. The object is not to sacrifice batting performance completely, but rather to maintain a desired level of batting performance while enlargening the sweet spot. To anticipate the present invention, this feature of relative stiffness, as well must be found, and recognized, in the prior art.

Finally, as an unanticipated result of the present invention was to establish an enlargened sweet spot, any anticipatory reference to the present invention must first contain structural features which clearly lead to such an improvement. Then there must also be a recognition of the nature of the improvement, at least for the purposes of 35 USC 103. One indication of the presence of the improvement of the invention is the characteristic that the level of batting performance across the modified mid-section where the sweet spot exists is flattened from the curvature that it would otherwise possess. This is in contrast to a bat wherein the batting performance across the center of the barrel is essentially "humped" in a shape akin to the top of a statistical distribution curve, or "normal distribution" curve. Figures 9 and 10 of the specification distinguish between these two configurations.

Thus one indicator of the presence of the immediate invention in a baseball bat is the feature that a relatively flattened batting performance factor is established over the mid-section of the barrel. This is now the distinguishing characteristic of Claims 14 and the claims dependant thereon.

Amendment in response to 35 USC 102 (b) Rejection

The applicant will now address the substantial basis for the rejection, as raised by the examiner. Principally, the examiner states that claims 14, 15, 16, 19, 20, 31/(14, 15, 19, 20), 32/(14, 15, 19, 20), 33/(14, 15, 19, 20), 40, and 42/40 are rejected under 35 USC 102 (b) as being anticipated by Fritzke '022, Figures 14, and 15. Fritzke '022 is the published version of application serial number 10/033,805 filed December 8, 2001 (now US 6,733,404). Further, that filing was a Continuation-in-Part of serial number 09/396,700 filed September 15, 1999) (now US 6,497,631).

Previously, the applicant had amended the claims in their entirety with Claim 14 being the first independent claim of the new claims. It is now proposed to amend Claim 14 to read as follows:

14. (Currently amended) A tubular baseball bat with a longitudinal axis comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall with a sweet spot area within its length, and a tapered bridging portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

a) a distal end remote from the handle;
b) a proximal end where the tapered portion connects to the handle portion;
c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area;
d) two lateral regions extending on either sides of the mid-section towards the distal and proximal ends respectively, and
e) a radial stiffness for the barrel wall at each location along the length of the barrel portion,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion**[[.]],**

to provide a flattened batting performance over the mid-section that is flattened compared to what otherwise would exist without the presence of the greater radial stiffness in the mid-section and and which is characteristic of an enlarged sweet spot.

Review of Fritzke '022

The Examiner had rejected Claim 14 in the form pending prior to the present Response as being anticipated under 35 USC 102(b) in view of Fritzke '022, Figures 14, and 15. As noted above, the Examiner first cited Fritzke '022 in his Office Action of October 4, 2005.

The applicant wishes to reiterate that Fritzke '022 does not contemplate construction of a baseball bat having a widened sweet spot. Fritzke specifically states:

"[0013] ..... The composite layer provides several advantages, including improved durability with little or no reduction in performance."

And,

"[0068] .....The present invention, however, overcomes these shortcomings by combining the elasticity and isotropic shear strength of the tubular sleeve (at the center of this load bearing member) with the circumferential strength of a thin

composite material (at the outer surface of the load bearing member) to produce a bat with improved durability and little or no reduction in performance."

And,

[0076] By way of example, a particular insert design which has been found to exhibit excellent durability and performance characteristics for hitting a softball is illustrated in FIG. 14.

In summary Fritzke discloses/teaches reinforcing the then prior art insert of a double-wall, all-aluminum bat of the prior art type, with a secondary, composite layer(s) with the objective of improving durability without adversely affecting performance.

Accordingly, this reference does not disclose discovery of the principle of the invention as established in the present application. It does not teach that a flattening of the batting performance over the mid-section of a barrel can be achieved by radially stiffening the mid-section of a barrel wall relative to the lateral sides with the result that the sweet spot is enlargened.

Furthermore, in the face of these statements, the examiner cannot take the position that Figures 14 and 15 of the Fritzke '022 disclosure meet the test of providing an enabling disclosure to achieve the effect of the present invention. Fritzke '022 does not teach that he is achieving a flattened batting performance parameter over the mid-section of the Fritzke design, nor a wider sweet spot. In so far as the stiffening of the mid-section of the barrel gives rise to the benefits of the invention, this is an issue of degree in which the underlying thickness of the barrel wall, particularly in the lateral regions, has a role to play. Fritzke '022 does not make any disclosures with respect to the embodiments of Figures 14 and 15 that ensure that the reader will be able to achieve the effect of a broadened sweet spot. It is not clear from the disclosure in Fritzke '022 that the degree of increased thickness provided by the layers 44 and 46 of Fritzke's Figures 14 and 15 would provide this effect. Fritzke does not provide a value of the thickness for the portion of the barrel wall underlining his layers 44, 46 nor the associated frame, both of which are required to establish the stiffness of the barrel wall.

The examiner may consider or suggest in response the possibility of referring to other figures in the Fritzke '022 disclosure to obtain a hypothetical thickness for the barrel wall associated with Figures 14 and 15. But to do so is to make a presumption and this is effectively an acknowledgment that the Fritzke '022 disclosure does not explicitly provide this data with respect to Figures 14 and 15. Accordingly, the disclosure in Fritzke '022 does not lead directly and unerringly to the invention as defined in the claims of the present disclosure, as now amended. For this reason, Fritzke '022 cannot be applied as a 35 USC 102 (b) reference against the claims of the pending application.

Fritzke calculation

If the examiner were to attempt to make such an analysis, this procedure would have to start in paragraph [0076] of Fritzke '022 which provides as follows in referring to Figure 14:

> "[0076]..... As one illustrated embodiment, ***the first composite layer 44 is about 8.5 inches long and about 0.003 inch thick*** [emphasis added] and is positioned on the tubular sleeve 24 such that the first end 48 is about 4.00 inches from the first end 20 of the insert 18. **The *second composite layer 46 is preferably about 4 inches long and about 0.0055 inch thick*** [emphasis added] and is positioned on the top of the first composite layer 44 such that the first end 50 of the second composite layer 46 is about 7.25 inches from the first end 20 of the insert 18.

Accordingly, the total thickness of the two layers is no more than 0.0085 inches. Further, according to the dimensions as given, the second composite layer extends up to 11.25 inches from the handle end of the insert 18 (7.25 inches + 4 inches). Elsewhere, the barrel length is variously recited as being 12 inches, para [0072] or 13 inches, para [0063] in length. Only the "tubular sleeve" of the insert is said to be 13.25 inches in length.

The first composite layer 44 is said to, in the above quoted paragraph, extend 12.5 inches from the handle end of the insert 18 (8.5 inches + 4 inches). This must mean that insert 18 is at least 12.5 inches long and that the barrel is similarly at least that long. This leaves only 0.75 inches between the end of the second composite layer and the end of the insert and barrel portion of the Fritzke '022 bat. This disqualifies the composite layer 44 from being located in the mid-section region of the barrel.

Further, if the first composite layer 49 extends to the distal end of the insert 18, then the second composite layer adds only an additional thickness of 0.0055 inches to the overall thickness of the barrel wall of Fritzke '022 bat at that end. It is far from clear what effect such a limited increase in thickness will have on the dimensions of the sweet spot or region of flattened batting performance.

Additionally, paragraph [0072] of this reference provides:

> [0077] The thickness of the insert 18 therefore is greatest near the center where there are two concentric layers of composite material and decreases (incrementally) towards the first and second ends of the insert (which are not covered by any composite material). Such an embodiment is advantageous because it provides the greatest thickness and strength in the area where most impacts occur, and less thickness and less weight (and hence greater flexibility) in the area where the stress is less. This design therefore behaves much like a tapered beam. As a result, less material is needed for the tubular sleeve 24 and impact portion12. Further, by using a shortened second composite layer 46, no more high cost composite material is used than is actually needed.

This paragraph does not correct the dimensional stipulations of paragraph [0076]. The thickness is said to be greatest near the center of the insert 18. But the insert extends towards the cap end of the bat, leaving only 0.75 inches between the end of the second composite layer and the end of the insert and barrel portion of the Fritzke '022 bat.

Paragraph [0080] then continues:

> [0080] It will be appreciated that many of the features and principles described above can be combined to create bat designs better suited for different applications or at least to provide alternative design approaches. For example, FIG. 15 illustrates that the insert embodiment of FIG. 14 can be modified to provide a second composite layer 46a (overlying first layer 44a) having separate bands of composite material. In this way, the bat's impact portion is given additional strength and stiffness in select local locations and directions to fine-tune the bat's impact response behavior. Though not shown, the second layer could be provided with three or more bands of composite material; the first and second layers could be bonded to the inner surface of the insert; and a third layer of composite material with the same or different reinforcing characteristics could be bonded to the second layer. These principles also can be applied where the insert is mounted in overlying relationship to the impact portion.

No dimensions are given for the thickness of such layers. Their positioning with respect to the mid-section of barrel portion of the bat is indeterminant. Thus the only portions of this disclosure which addressed the thickness of such additional layers are the words in paragraph [0076], above, totaling 0.0085 inches and more precisely providing for an increased thickness over both lateral sides of the layer 46 of only 0.0055 inches. Without knowing the thickness of the associated other barrel wall elements, these thicknesses are insufficient to establish the existence of a significant enlargening of the sweet spot in the embodiments.

There is no direct disclosure in Fritzke '022 related to the description of Figures 14 and 15 as to the thickness of the frame or supporting member, otherwise identified in respect of Figure 2 as being a metallic tubular sleeve 24. Accordingly, there is no direct disclosure in Fritzke '022 as to the <u>percentage</u> contribution to barrel wall thickness provided by the additional first and second composite layers 44, 46 as shown in Figure 14 as compared with the thickness of the other portions of the bat wall in the Fritzke '002 bat.

While there is no explicit teaching as to the thickness of the underlying layers of the members identified in Figures 14 and 15 of Fritzke, elsewhere in the Fritzke '022 disclosure the following data is provided with respect to the reinforced sleeve of Figure 3:

> [0063] ...As one illustrated example, the tubular frame 11 has a yield strength of about 85,000 psi and the impact portion 12 is about 13 inches long with a wall thickness of 0.050 inch. The tubular sleeve 24 is about 13.25 inches long with a wall

thickness of 0.054 inch. The composite layer 26 is about 8.5 inches long and about 0.055 inch thick,

If these values for barrel wall thickness are to be projected onto Figures 14 and 15, to which procedure the applicants object, the following analysis can be made:

Using the barrel wall thickness data from paragraph [0063], the hypothetical relative thickness of the composite layers 44, 46 might speculatively be calculated as representing (0.050 inch+0.054 inch+0.0085 divided by 0.050 inch+0.054 inch = 1.08173) or an increase of 8.173% over the underlying total thickness of the Fritzke' 022 bat wall based on bat wall dimensions taken from para [0063].

This figure assumes that both the first and second composite layers 44, 46 leave room for lateral regions having thickness based on the wall thicknesses of the frame 11 and sleeve 24 combined. This has been shown to be inconsistent with the layout as provided in Fritzke's paragraph [0072]. If provision is made for lateral regions of lesser thickness to include the lower composite layer 44, then using only the second composite layer 46 to provide increased thickness, the thickness differential becomes [(0.050 + 0.054 + 0.003 + 0.0055)/(0.050 + 0.054 + 0.003)] = 1.0514 or just 5.14%.

It is to be noted, however, that this is a purely hypothetical calculation that assumes the use of the insert of Figure 14 with the bat having a frame wall thickness of 0.050 inches and a tubular inner sleeve thickness of 0.054 inches. There is, however, no express data in Fritzke '022 that teaches the relative thickness of the composite layers 44, 46 of Figures 14 and 15 with respect to the underlying bat wall components.

Unrecognized Accidental Creation

Fritzke in his application Fritzke '022 clearly did not appreciate that his proposals might have the effect, if in fact they did, of enlarging the sweet spot of a baseball bat. The above discussion raises serious doubt that Fritzke provided a formula which would significantly enlarge the sweet spot of a baseball bat.

The law is clear in this respect: "[A]n accidental and unappreciated duplication of an invention does not defeat the patent right of one who, though later in time, was the first to recognize that which constitutes the inventive subject matter." Silvestri v Grant, 496 F.2d 593, 597 (CCPA 1974), as quoted by the United States Court of Appeals for the Federal Circuit in Invitrogen Corporation. v Clontech Laboratories Inc., decided November 18, 2005: http://fedcir.gov/opinions/04-1039.pdf

While this reference addressed priority of invention under 35 USC 102(g), the same principle should be applicable in the present case, so long as the applicant amends his claims so as to avoid contravention of 35 USC 102 (b).

Another decision by the Court of Appeals for the Federal Circuit on this point is Schering Corporation v. Geneva Pharmaceuticals Inc. which was decided on August 1, 2003. In this case the Federal Circuit addressed the question of anticipation by virtue of what was inherent in the prior art. After describing the old doctrine of excusing accidental anticipation as set out in Tilghman v. Proctor as being applicable to "accidental, unwitting and unappreciated" anticipation, the court pointed out that failure to recognize that something had been produced previously does not avoid anticipation if that something was clearly produced. This conclusion was reached by applying the principle that if something would be an infringement after grant, it is an anticipation if it occurs before grant. In this decision the prior anticipation was based upon use. In the present situation we are concerned only with what is explicitly disclosed in the Fritzke '022 publication, a disclosure which the applicant submits is insufficient to establish the effect which the present applicants have identified and invented.

In support of the applicant's position herein, the court in the Schering case went on to state that its reasoning was not intended to preclude the grant of claims to other than full anticipations. What mattered was that the subject matter was claimed properly. For example, had the claims been directed to a pure or isolated form of the anticipated metabolite, or directed to a pharmaceutical composition containing it, there would have been no anticipation.
Schering Corp. v. Geneva Pharmaceuticals (US Court of Appeals for the Federal Circuit) http://caselaw.lp.findlaw.com/scripts/getcase.pl?navby=search&case=/data2/circs/Fed/021540.html

Another relevant case is that of In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) a copy of which is provided separately for the convenience of the examiner. The claimed inventive wastewater treatment device had a tank volume to contactor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contactor ratio. Therefore the court held that the parameter being optimized by the applicant was not recognized in the prior art as being a result-effective variable. Accordingly, the court ruled that absent such recognition, a reference cannot be used as the basis for an obviousness rejection directed to the critical parameter.

Such a situation constitutes an exception to the rule that, where a variable has already been established, the discovery of an optimum value parameter is normally considered to be obvious, absent the presence of unexpected utility. That is the situation that exists in the present relationship with the Fritzke '022 reference; the present application falls into the class of the exception.

Additionally, the burden is on the examiner to raise a *prima facie* case when asserting obviousness over a cited reference. Where the reference does not recognize that a parameter has a controlling effect on the valuable characteristic identified in a subsequent application, no *prima facie* case of obviousness is established when the subsequent applicant presents claims with apparently closely positioned parameters. Accordingly, it is submitted that the applicant need

not show unexpected utility for the claimed range of parameters on the fundamental basis that the examiner has not established a *prima facie* the case of obviousness.

Application of the Unappreciated Duplication Principle to Fritzke '022

Nowhere in Fritzke is there any understanding that the inserts of Figures 14 and 15 that he proposes may be of such a dimension as to have the effect of enlarging the sweet spot within the barrel portion of his bat. What is missing from this reference is a clear teaching that the stiffened area is of such a dimension in relation to the barrel wall and design as to enlargen the sweet spot, and concurrently flatten the batting performance curve. This is because the inventor in that document did not contemplate the objective of enlargening the sweet spot. He did not possess this inventive concept at the time of his preparation of the application leading to the publication of Fritzke '022!

This same inventor, Fritzke, has gone on to file a continuation-in-part application, serial number 10/762,024 published as publication number US 2004/0152545. That continuation application was filed on January 21, 2004, a date which is three months later than the present inventors' filing date. In this subsequent application, the same sole inventor, Mark A. Fritzke explicitly provides a description and disclosure as to how to enlarge the sweet spot on a baseball bat with a corresponding flattening of the batting performance curve. This reflects on the inventor's earlier lack of appreciation of the significance of these newly-identified characteristics, and his earlier ignorance of the unexpected benefits of thereby enlargening the sweet spot.

As stated above, Fritzke '022 does not provide a value for the barrel wall underlining his layers 44, 46. A stipulation as to the degree of increased thickness provided by the layers 44 and 46 of Fritzke's Figures 14 and 15 over that of the thickness of the underlying barrel wall is needed to determine whether a broadening of the sweet spot in Fritzke '022 would be inherent. Fritzke does not provide a value for the barrel wall i.e. the underlying sleeve and frame, underlining his layers 44, 46. Accordingly, it cannot be said that this publication describes the invention as now claimed in the present inventors' application. For this reason, Fritzke '022 cannot be applied as a 35 USC 102 (b) reference against the claims of the pending application.

The absence of an earlier recognition of the importance of the sweet spot, radial stiffness and thickness issues in this string of references argues strongly that this concept, as conceived by the present inventor and now defined in Claim 14 and the claims dependent thereon, was an inventive advance, at least as of the filing date of the present application, September 29, 2003, and even previously thereto. Accordingly, rejection of Claims 14 under 35 USC 103(a) on the basis of Fritzke '002 would also be inappropriate.

There remains to establish the correct wording for the claims so as to ensure that they do not transgress 35 USC 102 (b).

Wording of Claim 14

Claim 14 now stipulates for the specific characteristic of increased radial stiffness for the mid-section region of the barrel portion of a bat, sufficient to provide a batting performance over such mid-section that is flattened compared to what otherwise would exist without the presence of a greater radial stiffness in the mid-section.

As Claim 14 now includes wording which does not read-on the disclosure in the Fritzke '022 reference, it cannot be said that Figures 14 and 15 of Fritzke '022 represent an anticipating disclosure.

The balance of the claims in the application up to Claim 36 inclusive are dependent from claim 14. For this reason alone such claims do not transgress 35 USC 102 (b). Further, such claims introduce additional limitations removing them even further from such a transgression.

Claims 15 – 18, Composite-containing barrel wall

The examiner rejected Claims 15, 16 as anticipated. These claims all address bats with the barrel wall that comprise polymer composite material. Claims 15-18 depend from Claim 14 and are distinguishable from. Fritzke '002 on that basis.

Claims 37 – 39 All-composite barrel wall

Claims 37-39 are independent. The examiner rejected Claims 17, 18 and 37 - 39 as being obvious over Fritzke '022. These claims now all stipulate that the barrel wall:

> " **consists of** polymer composite material ".

As such, all of these claims address a bat with a barrel wall which consists of, rather than comprises, a polymer composite material. Fritzke '002 described a bat which was partially made of aluminum. Therefore Claims 37-39 do not describe the bats in the Fritzke '022. Claims 37-39 all include the limitation:

> " the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion".

Because this distinction makes a difference that was not recognized by Fritzke '022, namely the result of improving the sweet spot, it cannot be said that this claim is obvious in view of Fritzke '022.

In respect of Claims 37-39 there is no suggestion in Fritzke '022 of making a bat that meets this stipulation of having a substantially all-polymer composite barrel wall wherein the barrel wall in the mid-section is radially stiffer than the barrel wall on the lateral two sides. Fritzke '022 addresses a bat having separate components in the bat wall, an outside frame and an inside sleeve, and proceeds on the premise that his use of

aluminum for these components requires strengthening by the addition of some composite material. As Fritzke is focused on strengthening an aluminum wall bat, there is nothing to suggest from his disclosure that the mid-section of an all-composite barrel wall should be provided with a greater radial stiffness than the lateral regions on either side. In the absence of such a suggestion, it cannot be said that these claims are obvious over Fritzke '022, much less anticipated.

Claims 37-39 are written in independent form without the functional limitation of Claim 14. Claims 38 and 39 have now been corrected to distinguish between the cases where: the density of fibers is greater in the mid-section - Claim 38; and the stiffness of the fibers is greater in the mid-section - Claim 39.

Additionally, Claims 18, and 39 rely on characteristics other than fiber orientation, namely fiber stiffness, to provide a differential radial stiffness in the mid-section of the barrel portion. Paragraph [0064] of this present application states: " The fiber types, and/or fiber angles, and/or fiber sizes, and/or composite thickness can be designed such as to graduate the radial stiffness of the barrel wall within the barrel portion 1 along its entire length."; and as amended, this paragraph [0064] states that the radial stiffness generally in the sweet spot area 19 can be provided through use of: ".... a localized area of fiber type **of greater stiffness**". Fritzke '022 contains no suggestion of varying the fiber type. This is a further basis for distinguishing such claims from Fritzke '022.

Vacek - Claim 36/(16, 17, 18)

The examiner had rejected Claim 36/(16, 17, 18) pursuant to both 35 USC 102(e) and 35 USC 103(a) as being anticipated and obvious over Vacek in view of Fritzke. Vacek is a pending application that was filed on May 12th, 2004. This filing date is after the filing date of the present application. Vacek claims divisional status from an earlier application filed May 14, 2003. Vacek further claims continuation-in-part status from an even earlier application. The examiner is relying on the May 14, 2003 application.

As Claim 36 is dependent on the earlier Claims 14-27, it therefore incorporates the limitations that stipulate for a greater stiffness in the mid-section of the barrel portion than the lateral regions. The examiner acknowledges that Vacek does not disclose stiffening the center of the barrel. More precisely, Vacek does not disclose relatively stiffening the center of the barrel as compared to the lateral two regions. Accordingly, a 35 USC 102 (e) rejection is not justified.

Turning to the obviousness rejection, the examiner seems to suggest that Vacek discloses varying the angles of fibers to provide greater radial stiffness and using a stiffer fiber type to accomplish variations in barrel stiffness along the barrel, akin to the same result as achieved in the present invention. However, Vacek's disclosure is in the context of making changes to bat properties (e.g. stiffness and strength) from one bat design to

the next, but not within a given bat design. In particular, Vacek does not propose or suggest making changes to such parameters along the barrel length of a given bat as in the case of the present invention

This reference is directed to improving the performance of a bat having a typical prior art barrel wall. This is the opposite objective to that of the present invention. The secondary members described in Vacek extend for the greater part of the length of the barrel portion and Vacek does not teach providing lateral regions of reduced stiffness which are a feature of the present invention. Claim 14 and the claims dependent thereon, including claim 36/(16, 17, 18), are therefore distinguishable from Vacek and Fritzke '022 combined to a degree that renders them patentably distinct.

Claims 18, 32, 33, 38 and 39 Fiber characteristics

The examiner has stated in respect of Claims 18, 32, 33, 38 and 39 that it is known that different fibers comprise different stiffness. On this basis, the examiner would refuse these claims as obvious over Fritzke '022. However, Claims 18, 32 and 33 depend upon Claim 14 and are subject to its limitations and arguments made in support thereof. And in respect of Claims 37 - 39, these claims now refer to bats with barrel walls of substantially all-composite construction and these claims have been distinguished on this basis elsewhere in this Response.

Claims 19, 20, Thickness

The examiner rejected Claims 19 and 20 as previously pending under 35 USC 102(b) as being anticipated by Fritzke '022. These claims depend from Claim 14 and therefore contain the limitations now provided in that claim. Additionally, these claims now include by amendment the further distinguishing feature that the thickness differential for the mid-section is at least 8 1/3 %.

As there is no explicit basis for determining the thickness percentage values for Figures 14 and 15 of Fritzke '022 in terms of meeting the batting performance criteria now present in Claim 14, a rejection under 35 USC 102(b) would not now be appropriate. Further, on the basis of the inventive batting performance characteristic of the claims from which they depend, as addressed above, Claims 19 and 20 cannot now be said to be obvious in view of Fritzke '022. Again, Fritzke '022 contains no direct instruction for providing a relative thickness that would ensure achieving such a characteristic.

The examiner referenced his requirement that a special unexpected result must be shown in order to permit the patenting of a particular range. The MPEP states in this regard as follows:

" 2144.05 Obviousness of Ranges [R-3] - 2100 Patentability

"A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation (and thereby denied patentability -*explanation added*) In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor (sic for contactor) area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor (sic for contactor) ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). .... "

Accordingly, it would be wrong for the examiner to persist in his requirement that a special unexpected result must be shown in order to permit the patenting of a particular range.

Withdrawn Claims 21, 31/21, 32/21, 33/21, 41 and 42/41Thickness

The examiner did not make a rejection of claims 21, 31/21, 32/21, 33/21, 41, 42/41 which referred to thickness on the basis that these claims were withdrawn as not addressing the elected species. This issue is now moot. The thickness limitation has been quantified in Claims 19, 20 and 40.

Claim 31 Reduced batting performance

Claim 31 has been rewritten as an independent claim utilizing all of the limitations of claim 14 except that of a flattened batting performance as amended this claim addresses a bat wherein the batting performance of the bat within the mid-section is reduced from the level of performance that would exist if the stiffness of the mid-section were no greater than the stiffness within the lateral regions. The examiner rejected Claim 31 as anticipated by Fritzke '022.

In fact, Figure 5 of the Fritzke '545 publication depicts a batting performance curve which, while flattened after receiving the new treatment, is higher than that of the previous performance curve. This shows the danger of attributing qualities to a patent disclosure, e.g. Fritzke publication '022, which are not explicitly declared in that disclosure. Clearly, the examiner cannot say that Claim 31 is anticipated by Fritzke '022 when Fritzke himself is subsequently showing a contrary effect.

Nor can the examiner say that Claim 31 is obvious in view of Fritzke '022 for the reasons given above respecting Fritzke's lack of appreciation of the effect his barrel treatment might have on batting performance and sweet spot.

Claim 32 Graduated thickness

The examiner has rejected Claims 32 as being obvious in view of Fritzke. The applicant has, similarly to Claim 31, placed this Claim 32 in independent form. As well a technical amendment to this claim has been added as follows:

> 32. (Currently amended) ..... wherein the radial stiffness **of the barrel wall** of the barrel portion is graduated as proceeding from a location within the mid-section of the barrel portion through to a location within the lateral regions of the barrel portion wherein the barrel wall has lesser radial stiffness than in the mid-section."

As this claim incorporates the stipulation that:

> " the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion"

and stipulates that the radial stiffness of the barrel wall is graduated, as quoted above, it cannot be said that this claim is either anticipated or rendered obvious by Fritzke ' 022.

Claims 33-35 and 42-45 Length of the Mid-section

Claims 33-35 have been amended to parallel the lower range of percentage values set-out in Claims 43-45. The examiner rejected Claims 33 as anticipated and 34 -35 and 42-45 as being obvious over Fritzke ' 022 stating that unexpected results would have to arise from the exact length of the mid-section to render these claims patentable. The unexpected result achieved by the present invention is that adequate batting performance can be achieved while enlargening the sweet spot, so long as the lateral regions on either side of the mid-section of the barrel have a lesser radial stiffness than the radial stiffness of the mid-section.

It is important for the two lateral regions to have a lesser stiffness than the mid-section in order to provide adequate batting performance. If the mid-section is proportionally too long, then there will be insufficient space for the lateral regions to provide a "trampoline" effect. The size of the mid-section must be limited in order to leave room for lateral regions of sufficient size to be present.

While the present inventors have taken advantage of the high batting performance that can be achieved in existing bats, they are not proposing to enlargen the sweet spot by simply radially stiffening the mid-section of the bat. According to the invention, the mid-section of the bat must be stiffer radially than the radial stiffness in the two lateral regions. The lesser radial stiffness of the two lateral regions ensures that batting performance is still maintained at an adequate level, certainly at a level above that of a bat with a constant barrel wall thickness equivalent to that of the mid-section. Both lateral regions are stipulated. If the radial stiffness in the mid-section were simply greater

than the radial stiffness in one lateral region, it is believed that the benefits of maintaining adequate batting performance as intended by the present invention would not be reliably obtained.

Claims 33-35 and 42-45 limit the length of the mid-section with respect to the overall barrel length, and thereby with respect to the two lateral regions. In a situation where the Unappreciated Duplication Principle is applicable, it cannot fairly be said that the selection of an appropriate radial stiffness at a specific location in relationship to lateral regions to achieve the invention as contemplated by the present application would have been obvious. Fritzke's failure to perceive the invention is evidence to the contrary. These claims accordingly introduce a parameter which is not obvious in view of the prior art. On this basis, the examiner should withdraw his rejection of Claims 33-35 and 42-45.

Withdrawn Claims

Claims 22-30 address the stiffener depicted in Figures 4, 5, 7 and 8 and are properly withdrawn pursuant to applicant's election. In the event of the allowance of Claim 14 as a generic claim, the applicant requests the opportunity to provide amendments for Claims 22-30 to make them consistent with Claim 14 so that such claims may also eventually be allowed.

Claim 40

Claim 40 replicates Claim 19 but without inclusion of the amendment being added to Claim 14 that stipulates for a flattened batting performance characteristic. Claim 40 stipulates for an increased thickness in the mid-section of at least 8 1/3 percent. This is a thickness value not taught by Fritzke '002. Accordingly, for the reasons provided above, Claim 40 is neither anticipated nor obvious in view of Fritzke '002.

New Claims 46 - 51 - Thickness ranges

Following the principles set-out in In re Wertheim, the applicant is also adding claims addressing a range of thickness values for the mid-section of the barrel portion in terms of absolute values. Support for these claims has been addressed above. Paragraph [0062] as amended now provides:

> [0062] .....Just as the stiffener wall may be typically in the order of .005 inches to .040 inches in thickness, or .010 inches to .040 inches in thickness, or .015 inches to .040 inches in thickness, or 0.015 inches to 0.030 inches, so too the analogous increase in barrel wall thickness along the mid-section may fall within the same ranges.

There is no basis for saying that a person skilled in the art would not recognize the sub-ranges of .010-.040 and .015-.040 and .015-.040 as providing the benefits of the invention. "The greater includes the lesser" - In re Wertheim. The sub-ranges will be seen, therefore, is being equally operative to provide an enlarged sweet spot as they are part of the broader range as originally described. They are therefore part of the same invention.

New Claim 52 – Width of the sweet spot

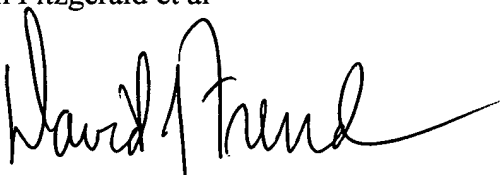
The applicants are also adding Claim 52 to stipulate for a minimum length for the region of flattened batting performance as defined by Claim 14. This is supported by Figure 10 and the reference to the increased length of the sweet spot to 4 inches occurring in paragraph [0062]. This Claim 52 refers-back to claims incorporating the flattened batting performance limitation. As such they are distinguishable from the prior art on the basis of the representations made above.

Conclusion

In view of the features and limitations of the claims as amended, it is submitted that the applicant is seeking coverage which is both novel and unobvious over the cited references, and over the prior art generally. Accordingly, reconsideration and a favorable ruling which will allow this application to advance to Allowance are therefore requested.

Respectfully submitted,

Stephen Fitzgerald et al
per



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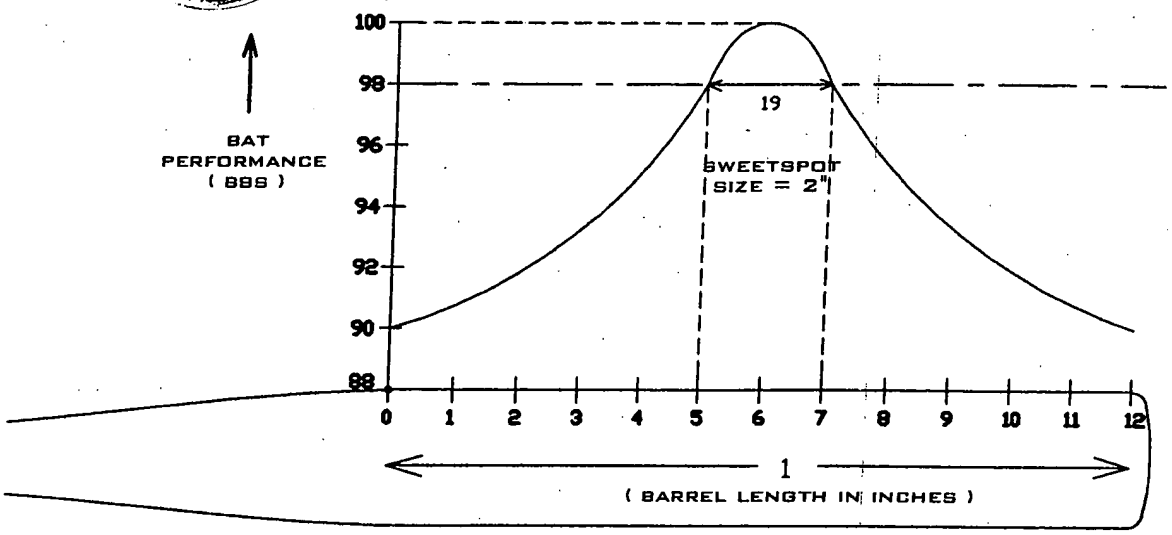

FIG. 9

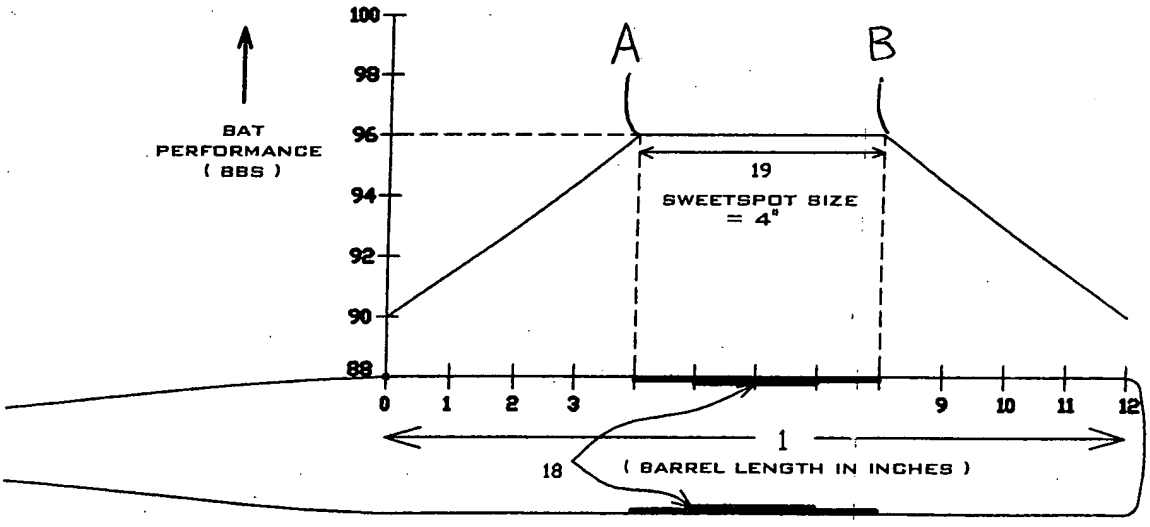

FIG. 10